

viz. 10h. 16m. 0.4s. Doubt has been occasionally expressed with regard to Sir W. Herschel's rotation-period from the uncertainty attaching to such observations, and the interesting confirmation of it just arrived at by the American observers will therefore be the more welcome. The Herschelian rotation for the planet globe of Saturn has been sometimes confounded with a rotation not depending upon observations, but calculated on Kepler's law for a satellite at an apparent mean distance equal to the semi-diameter of the middle of the ring; thus, Baily, in his "Astronomical Tables and Formulæ"—which were widely quoted for many years—has 10h. 29m. 17s. for time of rotation both of the globe and the ring.]

THE NEBULA IN THE PLEIADES.—Mr. Maxwell Hall, of Jamaica, communicates some observations of this nebula made on October 20, 1876, with a 4-inch Cooke equatorial, and power 55. "The nebula was 'bright,' according to Sir John Herschel's scale, and extended in a parabolical form at least 40' from Merope, which was at the focus, while the axis of the figure was nearly S. of that star."

The difficulty of seeing with very large instruments a very faint nebulousity in close proximity to a bright star is strikingly illustrated by a remark made by Mr. Dreyer, observing with Lord Rosse; he states—"The Merope-nebula is never perceived with Lord Rosse's telescopes." So also D'Arrest sought for it in vain with the Copenhagen refractor, subsequently referring it to the class of which we are writing, which may be invisible in a great telescope but seen without difficulty in the finder. Vols. lviii. and lix. of *Astronomische Nachrichten* may be consulted for the earlier discussions as to the variability of this object.

VARIABLE STARS.—Prof. Schönfeld has published in *Vierteljahrsschrift der astronomischen Gesellschaft*, xi. Jahrgang, Heft 4, an ephemeris of the maxima and minima of most of the variable stars for 1877, including Algol, λ Tauri, S Cancri, δ Libræ, and U Coronæ Borealis, which have short periods. The max. of χ Cygni is dated February 6, and the min. on September 15; Mira Ceti, min. on July 23, max. on November 10.

Schmidt's star in Cygnus was red on January 7, and about equal in brightness to the star + 41° No. 4243 in the "Durchmusterung," but the difference of only 0.5m. between the catalogue brightness of this star and that of + 42° No. 4204, certainly did not represent their relative intensity of light on this evening. The variable might be estimated at 7.2m. by reference to the latter star.

METEORS OF JANUARY 7.—In the early part of this night a number of meteors were remarked near London, with unusually slow motion, particularly in the cases of several which equalled Jupiter in brightness. One at 10h. 32m. G.M.T. starting from near λ and μ Ursæ Majoris, appeared to receive a sudden check, and was stationary for two seconds 3° below α Canum Venaticorum, where it was nearly extinguished, but a faint portion left a train for several degrees further. It was not easy to judge of the radiant point owing to continual interruption from passing clouds, but it would probably be somewhere about the stars in Ursæ Major above-named. Much lightning on this evening. The zodiacal light well seen as far as the principal stars of Aries.

THE MELBOURNE OBSERVATORY.—The Eleventh Report of the Board of Visitors of the Melbourne Observatory, with Mr. Ellery's Annual Report for the year ended 1876, June 20, has been received. In addition to the large reflectors, the Observatory now possesses an 8-inch equatorial, both instruments in excellent working order. With respect to the former, Mr. Ellery remarks that, although at present the mirrors retain their high reflecting polish exceedingly well, it is not to be overlooked that the time must arrive when they will require to be re-

polished, and in anticipation of this eventuality, which may occur sooner than is now looked for, he intends to devote time during the ensuing year to practice in grinding and polishing large surfaces. Out of about 150 nights during the year to which the report applies, which were more or less fit for observing with the reflector, forty were solely occupied with visitors. The astronomical work accomplished includes the examination, measurement, and sketching of seventy of the nebulae and clusters of Sir John Herschel's southern work, of which the greater number have been drawn and described in a manner suitable for publication. Mr. Ellery adds:—"The result of these observations indicates that several of the nebulae are considerably changed, while others appear so completely altered as to be scarcely recognisable, save by their position with respect to adjacent stars. The nebula about η Argus have been compared with a drawing made in March, 1875, but no decided changes were detected. The weather was so far unfavourable at Melbourne for certain classes of observations that out of ninety conjunctions of Saturn's satellites only ten could be observed. No material change in the regular work of the Observatory is contemplated during the year following the conclusion of the report. Observations with the transit-circle would be continued assiduously as in previous years, the Government Astronomer regarding this as the fundamental work of the establishment, which has already given it a reputation in the world, and he quotes in proof of this the opinion expressed by Sir George Airy, that the Melbourne Observatory had produced "the best catalogue of stars of the southern hemisphere ever published." The revision of Sir John Herschel's figured nebulae will also be continued, with occasional planetary work, as drawings of Mars and Jupiter, observations of conjunctions of Saturn's satellites, &c.

The early publication of results obtained with the great reflector is strongly urged by Mr. Ellery, and all astronomers will concur in his representations upon this point. Difficulties, no doubt, must exist in giving such results to the astronomical world in a perfectly satisfactory manner; nevertheless, Mr. Ellery thinks if a plan he proposes is approved, these difficulties may be surmounted, and all the completed work with the reflector may be forthwith published. We can only express the hope that work of such great interest, and which may so greatly add to the reputation of the Melbourne Observatory, will soon be in the hands of the public. The importance of early publications of astronomical work in these days can hardly be exaggerated.

METEOROLOGICAL NOTES

NEW DAILY WEATHER MAP.—We hail with the greatest satisfaction the appearance, on New Year's Day, of the first number of a daily international weather-map issued by the Austrian Meteorological Institute. It embraces nearly the whole of Europe, and supplies a want not met by any existing weather-maps, in representing the weather of Central and part of Southern Europe, with a satisfactory fulness such as the meteorology of this important region demands in the development of this branch of the science. In addition to the invaluable material this publication will lay before us from day to day relating to thunderstorms, the summer rains, and the falls of hail and snow of Central Europe, it will also furnish data absolutely indispensable in investigating the causes which determine the course and the rate of progress of the storms of North-western Europe. Indeed, in this respect, and consequently in the prognosis of British storms, the Austrian empire is, of all countries which lie eastwards of Great Britain, second in importance only to Lapland and the north of Scandinavia.

LOW TEMPERATURES.—During recent weeks some remarkably low temperatures have been recorded in various countries. During a heavy storm which occurred on December 17 over

all Canada and the north of the United States, and which was attended with considerable damage, the temperature fell at Ottawa to -30°O . What makes this temperature noteworthy is that at the same time the wind continued to blow with great violence, the low temperature being thus not confined to a few feet of the surface, but that of the aerial current passing over Ottawa at the time. On January 4 the temperature fell at Hernösand, in Sweden, and also in Lapland to -31°2 . An anticyclone of limited extent, with the characteristic calms and light winds, overspread this region at the time, and it is to be noted that the space of excessively low temperature embraced an area virtually coincident with, and equally as limited as, that of the anticyclone. Still lower temperatures are reported from the interior of Russia. The *Golos* gives the following information as to the unusually low temperatures which prevailed in Northern Russia before Christmas. The thermometer of the Physical Observatory at St. Petersburg (in town) showed on the 22nd, at 9 A.M., -37°8 Cels., and in the Botanical Garden (in the suburbs), between 7 and 9 A.M., the following temperatures were observed:— -38°1 on the 20th, -39°4 on the 21st, and -41°9 on the 22nd (-43°4 Fahr.) On the last-named day the mercury was frozen, and the readings were made from a spirit thermometer. So low a temperature as on the 22nd was never observed before at St. Petersburg in December, during the 123 years that regular meteorological observations have been made; and even during the coldest month, January, such low temperatures were observed before only four times, namely, -38° on January 26, 1868; -41° in 1760; -38°7 in 1772; and -39°0 in 1814. The region of low temperatures occupied a very large tract of land, and the cold advanced from the north-east, as was also the case during the unusual cold of 1868. On the 22nd there was observed in the morning, -40°4 at Vologda, -40°5 at Kuopio, in Finland, -39°9 at Bielozersk, -39° in Moscow (-40° in the higher parts of the town), &c. Very low temperatures might have been predicted for some days before, as already on the 20th the cold reached -44° Cels. (-47° Fahr.) in Vologda, and the barometer continued to rise in the whole of Northern Europe, whilst a minimum of pressure traversed the middle parts of Europe and Southern Russia, with comparatively high temperatures and cyclonic winds, which in the north and on the shores of the Baltic blew from the east and the north.

NOTES

A WEALTHY Copenhagen brewer, J. C. Jacobsen, has given the sum of a million of crowns for the promotion of mathematics, natural science, the science of language, history, and philosophy.

As we intimated some time since, the Swedish University of Upsala, founded September 21, 1477, will this year celebrate its 400th anniversary. Great preparations are being made for the event. The University is not only the oldest but the richest in Scandinavia; besides many rich gifts from Gustavus Vasa, it received, among other things, from Gustavus Adolphus, 360 farms, which now yield an annual rent of 200,000 crowns. The funds for maintenance and salaries amounted, in 1870, to 1,758,587 crowns, and the yearly Government grant to 300,000 crowns. The teaching staff consists of thirty-five professors, twenty-seven adjuncts, and fifty docents; the number of matriculated students amounts to about 1,500.

THE Royal Cabinet of Natural History at Stuttgart has just been enriched with an exceedingly rare and valuable palæontological specimen, which is probably without its like in the geological museums of the world. It consists of a group of twenty-four fossil lizards from the sandstone strata of Stuben. The

inclosing stone has been with great care entirely removed, showing a strangely intertwined mass, possibly as met by sudden death, but more probably a collection of dead bodies gathered together by the action of the waves. They cover a space of about two square yards, and the individual specimens possess an average length of thirty-two inches. These fossils can be classed with no existing species, but appear rather to possess a combination of diverse characteristics, which at a later stage of development became distinctive features of quite different types. Prominent among the peculiarities are the bones of the extremities, resembling those of existing lizards; the head, which can almost be called a bird's head, and the massive scaly armour, consisting of sixty to seventy successive rings.

WE notice with great pleasure that decided steps are about to be taken to reform the curriculum in Exeter Grammar School. It is intended, as soon as arrangements can be completed, that the younger boys shall be taught divinity, English, including history and geography, French, Latin, arithmetic, and the other elements of mathematics, drawing, and some elementary natural science. At a certain point in the school Greek will be added, in accordance with the provisions of the Scheme and the resolution of the Governors; or in lieu of the study of Greek more time will be devoted to mathematics, English, modern languages, and natural science. German will be taught to any boys sufficiently advanced in other subjects to make it desirable. Thus, it is hoped, boys will be adequately prepared for the Universities, for the Public Service, for professional or commercial life. The principle of this new scheme is excellent, and should it be faithfully carried out, Exeter Grammar School ought to become one of the most efficient and complete schools in the country. We hope that the school will receive every encouragement in this laudable effort to provide a complete course of instruction.

THE Vilna Observatory is reported to have been totally destroyed by a fire on December 28. The *Vilensky Vestnik* says that the combined efforts of the town and railway fire brigades, of the troops, and of the students of a college in the neighbourhood, did not succeed in overcoming the fire and rescuing the great refractor and photo-heliograph. Only books and instruments of smaller value were saved. This is a great loss to science, as the Observatory had done, during the last few years, very valuable work, and some of the beautiful photographs of the sun was exhibited at the South Kensington Loan Collection.

MR. F. B. MEEK, the eminent palæontologist, and for several years a member of the United States Geological and Geographical Survey of the Territories, under Prof. F. V. Hayden, died at Washington, D.C., December 21, aged fifty-nine years. He had just completed the great work of his life, the Cretaceous and Tertiary Invertebrate Fossils of the Upper Missouri Country, in one large quarto volume.

In the last Session of the Berlin *Anthropologische Gesellschaft*, Prof. Virchow stated that the intrepid young traveller, Herr v. Horn von der Horck, is at present in the camps of the warlike Sioux Indians, busily engaged in obtaining plaster casts for craniological studies. The printed record of v. d. Horck's journey of last summer to the Polar Sea, has just appeared in Germany, and contains much of value written in a very sprightly style. During the first half of the journey zoological and geographical ends were kept in view. On the return trip through Lapland to the Gulf of Bothnia, the expedition assumed an almost exclusively anthropological character. Enormous collections of bones and more especially of skulls were made, and a large number of masks were obtained from the present inhabitants of Lapland. So extensive and complete are these results, that Prof. Virchow regards them as more valuable for the study of Scandinavian craniology than the combined collections of